

mal, at least reasonable assurance against recurrent ulcer, but that postoperative achlorhydria is undesirable. My own experience with gastric resection in certain cases of duodenal ulcer has provided me with data which strongly support the thesis that postoperative reduction to approximately one-half of the preoperative degree of acidity provides a reasonable degree of assurance that an anastomotic or jejunal ulcer is a remote possibility. In accordance with this line of reasoning it has been my policy for the most part to confine the magnitude or extent of gastric resection in duodenal ulcer to the pyloric half of the stomach, including the lesser curvature angle of the stomach (hemigastrectomy) and usually the ulcer-bearing portion of the duodenum, resorting to slightly higher resection only in those cases in which the preoperative total acids exceed 100.

It is conceded, even though that has as yet not been my experience, that one may occasionally undershoot the target when performing hemigastrectomy for duodenal ulcer, and that an anastomotic or jejunal ulcer may follow resection of that extent. However, to aim at removal of 75 to 80 per cent of the gastric structure with the sacrifice of most, if not all of gastric function in all cases, for the purpose of obviating the development of an occasional anastomotic or jejunal ulcer, hardly seems justified. Such an approach to the problem of the cure of duodenal ulcer is quite analogous to the questionable thesis of total thyroidectomy in the treatment of hyperthyroidism, whereby the clinical manifestations and problems of hyperthyroidism are exchanged for those of myxedema.

The results of gastric resection in duodenal ulcer must be analyzed at their full value, not only as they pertain to the curability of the ulcer but in terms of nutritional changes and deficiency states as well and in terms of the physiological and biochemical processes in the organism as a whole, as they are influenced by the magnitude or the extent of the gastric resection. The evidence is far from conclusive that the curability of benign duodenal ulcer is dependent upon radical three-quarters or four-fifths gastric resection, and that in order that cure of the ulcer may be achieved, the sequelae of major if not total loss of gastric function must be accepted.

The basic principles upon which the philosophy of gastric resection in certain cases of duodenal ulcer is founded are today generally accepted as entirely sound, and partial gastrectomy has attained a status in the surgical treatment of this disease which may be sustained and enhanced by the judicious selection of cases wherein it is justifiably applicable in accordance with its objectives. Through the future universal adoption of a method by which the extent of gastric resection may be designated in terms of the amount of stomach removed, an opportunity may be provided for analysis of the advantages and disadvantages of the various magnitudes and extents of gastric resection, not only as pertains to the curability of duodenal ulcer but as pertains to the organism as a whole.

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EMERGENCY TRANSFUSIONS: SUGGESTIONS FOR HOSPITALS, CLINICS, AND LABORATORIES

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EVERY day urgent requests for information pour into the Irwin Memorial Blood Bank of the San Francisco County Medical Society from all parts of the Far West. We are taking this opportunity to answer the questions most frequently asked. These may be condensed into four parts:

Question 1.—How can we best protect the lives of disaster patients when they need an emergency blood transfusion?

Question 2.—Can we obtain blood and plasma from your Bank if we build up a reserve?

Question 3.—How can we doctors in towns removed from San Francisco help in the Red Cross Procurement project?

Question 4.—Can we call on your Bank for blood if we are faced with an emergency problem in our community even though we have not built up a credit?

Before we answer these specific questions let us say that this is a time for clarity of thought and logical planning. Make available and use every resource that is at hand instead of waiting for or depending on larger or more completely stocked centers for transfusion fluids. The following suggestions will amplify and clarify our statement.

Answer 1.—We advise that all professional, technical and other personnel of hospitals, clinics, and laboratories have immediate typing and serology tests performed so that each such center, no matter how small, may form a blood bank nucleus for immediate emergency use in case an unforeseen accident occurs in their center. Particularly guard your type 4's(0), know where they can be reached night and day. Eventually every adult in the community should be typed and each adult must carry his identification type card with him. Never forget that the finest container made for blood is the human body—this fact must be re-emphasized again and again in order to counteract a certain uneasiness among some groups. Type as many people as you possibly can, card index your donors and when that is accomplished you have a potential blood bank available for instant use.

Answer 2.—At the present time we are operating a non-profit Blood Bank supplying (a) whole blood to the Hospitals of the San Francisco Bay area on call throughout the 24 hours. (b) The Irwin Memorial Blood Bank of the S.F.C.M.A. was appointed the Red Cross Procurement Center for Northern California. This appointment entails drawing blood from volunteer donors and such blood will be sent for processing to the Cutter Laboratory in Berkeley.

It is certainly possible for you to obtain whole blood at any time from our Bank on payment of

our small maintenance fee, plus a donor to replace the blood that was sent out. Hospitals outside the confines of San Francisco must absorb the extra delivery fee. The Greyhound Bus service has been quite prompt in expediting deliveries to the Peninsular Hospitals.

Answer 3.—Please read the announcement in the January C. M. A. Suffice it to say there will be an opportunity for every medical man to assist. As a matter of fact the entire plan devolves on your full cooperation. It will not fail.

Answer 4.—The Blood Bank was created particularly to care for those who need blood, be it an emergency or otherwise. However, taking a theoretical problem. Hospital X has built up a reserve of 100 units. Hospital X asks for 75 units immediately to take care of some disaster, but Hospitals A and B likewise have a reserve and wish to draw on that reserve to the limit. Our policy in this case would be to send as much blood as possible to all three hospitals but without emptying the bank completely.

SUMMARY

In closing let us emphasize certain points: Go over your bleeding and donor sets to make sure you have sufficient rubber tubing and needles—always cleanse and sharpen the needles, reassemble and sterilize after use so that you always have sets immediately available. Check your flasks, funnels, syringes etc., and stock of anticoagulant, if short, replenish immediately.

Type and card index *all* personnel paying particular attention to Type (0). The cost for this service should not be borne entirely by physicians.

If possible acquire several flasks of liquid serum. (Cutter) We suggest serum, for plasma in the liquid state develops fine granular precipitates and fibrin veils; these are not, however, of any concern and only require filtering out. If not too far removed from San Francisco build up a reserve of blood donors so that you can call on us for whole blood. When the national emergency has past we will undoubtedly make available frozen plasma and dried plasma.

We invite your questions. If in San Francisco please pay our Blood Bank a visit—you are always welcome.

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NEWER PHYSIOLOGY OF THE BILIARY TRACT AND ITS APPLICATION TO BILIARY TRACT DISEASE*

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THE gallbladder and extrahepatic bile ducts rank high among the causes of gastro-intestinal symptoms for which patients seek medical aid. A better appreciation of the physiological

processes involved may help us to understand some of their abnormal manifestations or pathological conditions. It is my purpose, first, to review briefly the fundamental functions and activities of the biliary tract, then to discuss how the distention of the biliary tract may reflexly affect other organs or viscera, and to cover, in summary, the anatomy, physiology and pharmacology of the sphincter of Oddi as well as the physiology of bile and some of its practical features.

GALLBLADDER FUNCTIONS

The gallbladder possesses two general functions: it is a bile reservoir and a pressure regulatory mechanism. In species which secrete relatively small amounts of bile daily, a gallbladder is present to store and concentrate the bile until after the next meal, when the response of the mucosa of the upper part of the small intestine to fats and acid, produced by the liberation of the hormone cholecystokinin, causes the gallbladder to contract and discharge its contents into the duodenum.¹ The flow of this concentrated bile, because of the bile salts it contains, acts as a trigger mechanism and causes a choleretic or increased secretory effect on the liver, which in turn leads freshly-secreted bile to enter directly into the duodenum during the digestion of the meal.

The importance of the gallbladder as a regulatory mechanism has been stressed many times by Ivy² and his coworkers. The secretory pressure, or the pressure above which the liver will not secrete bile, is 30 cm. of bile pressure. The evacuatory power of the gallbladder is no greater than from 20 to 30 cm., while the average resistance of the sphincter of Oddi is from 9 to 25 cm. The resistance of this sphincter mechanism may be elevated temporarily to as high as 75 cm, in which case the bile secreted by the liver would slowly fill the gallbladder, thereby preventing back-pressure on the hepatic cells. In order to keep the pressure in equilibrium, when the gallbladder contracts, the sphincter relaxes. Thus an explanation of the three types of biliary dyskinesia is tenable. 1. The hypermotile type is characterized by increased motility of the gallbladder with rapid emptying, which may produce colicky pain. 2. In the hypertonic type, the gallbladder attempts to contract against a spastic sphincter. 3. Atonic distention of the gallbladder causes an aching pain over that region. A low fat diet and alkalies should be used in the first type, and a high fat diet, plus acid foods, in the third, while methods used to relieve spasm of the sphincter should be tried in the second, as well as the treatment of colonic stasis which might reflexly affect the sphincter. Many of the surgical failures in disease of the gallbladder fall into the group of dyskinesias, accounting in part for the poorer results following the removal of the stoneless gallbladder. Surgical or pathological cholecystectomy usually is followed by changes in the resistance of the sphincter and dilatation of the extrahepatic bile ducts, suggesting a further control of the gallbladder over the regulation of

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† For additional comment on Irwin Blood Bank, see page 20.